

HYDROMATIC

*New Hamilton Airscrew Development
to be Built by De Havilland's : Quick
Feathering*

THE De Havilland airscrew works are now being equipped for the large-scale production of the Hamilton Hydromatic full-feathering airscrew which has been released by the American authorities.

The new airscrew has been introduced because performance has reached the point where the range of pitch-adjustment of existing airscrews is barely sufficient. Not only are speed ranges and ceilings increasing, but there is a strong demand for power diving in the military field. All these factors tend to demand a greater pitch range, and whereas the first controllable-pitch airscrews had a range of only four or five degrees, current types are using up to twenty degrees, and projected types will need still more. Moreover, there is a need in certain types of aircraft for a means of stopping the rotation of engines which have failed. Friction brakes acting on the shaft have been tried, but usually their action is comparatively slow. If, however, the pitch angle of the airscrew is rapidly increased to about 87 degrees at the three-quarter radius point, rotation is stopped almost instantly and the resistance of the idle airscrew minimised. The practice of adjusting airscrews to this angle is called "feathering." It is claimed by the Hamilton Company that the difference in the ceiling of a twin-engined machine with one airscrew feathered compared with one in similar conditions having one airscrew braked may be as much as 2,000ft.

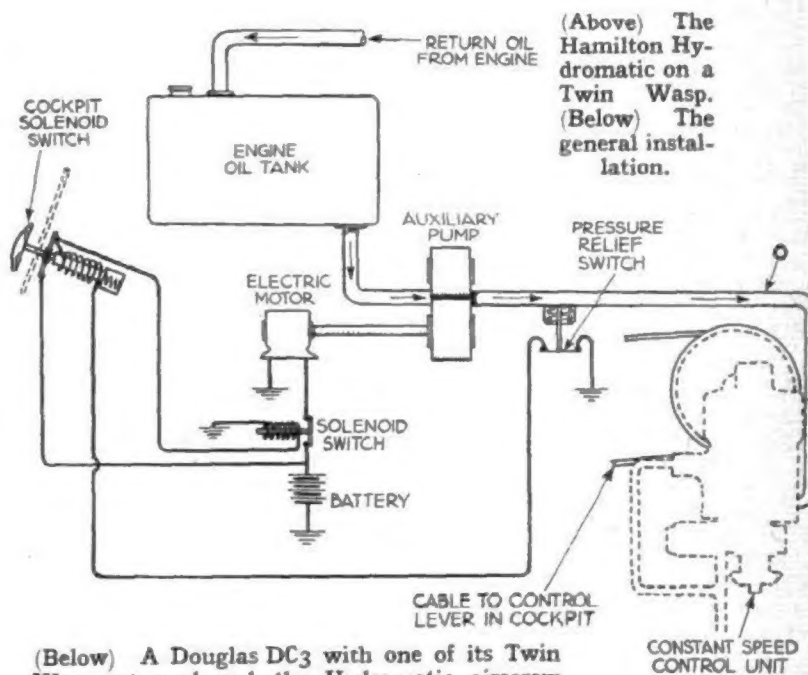
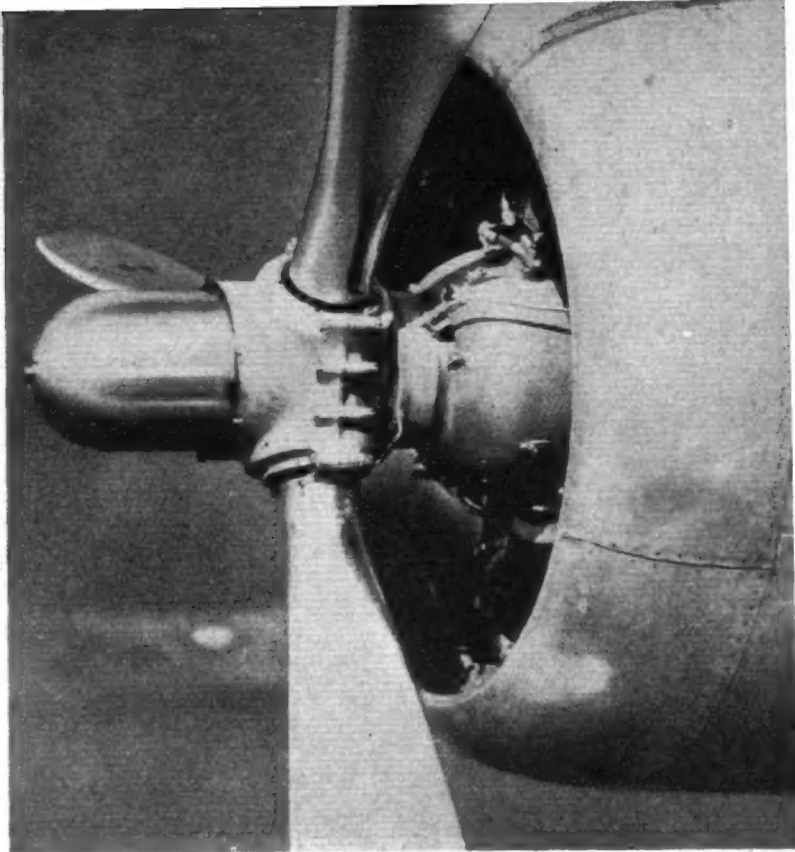
Principles Retained

Although the complete mechanism of the airscrew has been redesigned, the change was accomplished without departing from the highly successful hydraulic principle and the proven hub and blade-mounting structure of the older type.

The new airscrew is extensively specified for U.S. Army and Navy aircraft, and both American Airlines and United Airlines are fitting their fleets of Douglas DC3s with Hydromatics as fast as they can be delivered.

The successful hub and blade mounting structure of the older Hamiltons has been further improved by moulding a collar of plastic material between the roller-bearing race and the fillet of the blade retaining shoulder. This ensures perfect seating of the mating parts, gives a better stress distribution, and protects the aluminium alloy blade from any chafing action, thus increasing its resistance to fatigue. The presence of the plastic layer also permits the use of an effective oil seal between the hub and blade. Such a seal would not be considered safe in direct contact with the blade as it might lead to stress concentration.

It would obviously be dangerous if the airscrews could be feathered inadvertently or through improper functioning of



(Below) A Douglas DC3 with one of its Twin Wasps stopped and the Hydromatic airscrew fully feathered.

